

(a) feeding a hydrocarbon feedstock derived from at least one of thermal treatment, catalytic treatment, extraction, dewaxing or fractionation of a petroleum crude or fraction thereof, shale oil, tar sands or synthetic crude, to a first hydrocracking zone containing a hydrocracking catalyst wherein said hydrocracking catalyst is a bulk metal catalyst comprising non-noble Group VIII metal molybdate in which at least a portion but less than all of molybdenum is replaced by tungsten [to produce a hydrotreated feedstock];

(b) hydrocracking the feedstock under hydrocracking conditions to produce a hydrocracked feedstock;

(c) conducting the hydrocracked feed to a second hydrocracking zone containing a second hydrocracking catalyst and hydrocracking the first hydrocracked feed under hydrocracking conditions to produce a second hydrocracked feed; and

(d) fractionating the second hydrocracked feed to produce a distillate lubricating oil fraction.

Amend page 3, line 11, third paragraph, of the specification as follows:


(a) feeding a hydrocarbon feedstock derived from at least one of thermal treatment, catalytic treatment, extraction, dewaxing or fractionation of a petroleum crude or fraction thereof, shale oil, tar sands or synthetic crude, to a first hydrocracking zone containing a hydrocracking catalyst wherein said hydrocracking catalyst is a bulk metal catalyst comprising non-noble Group VIII metal molybdate in which at least a portion but less than all of molybdenum is replaced by tungsten [to produce a hydrotreated feedstock];

Amend page 3, line 13, fourth paragraph, of the specification as follows:

(b) hydrocracking the feedstock under hydrocracking conditions to produce a hydrocracked feedstock ;

A clean copy of all pending claims and page 3 of the specification are also provided.

Respectfully submitted,


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CLEAN VERSION OF PENDING CLAIMS

1. A process for preparing lubricating oil basestocks which comprises:

(a) contacting a hydrocarbon feedstock derived from at least one of thermal treatment, catalytic treatment, extraction, dewaxing or fractionation of a petroleum crude or fraction thereof, shale oil, tar sands or synthetic crude with a bulk metal catalyst under hydrocracking conditions, said catalyst comprising non-noble Group VIII metal molybdate in which at least a portion but less than all of molybdenum is replaced by tungsten; and

(b) fractionating hydrocracked feedstock to produce a distillate lubricating oil fraction.

2. (amended) A process for producing lubricating oil basestocks which comprises:

(a) feeding a hydrocarbon feedstock derived from at least one of thermal treatment, catalytic treatment, extraction, dewaxing or fractionation of a petroleum crude or fraction thereof, shale oil, tar sands or synthetic crude, to a first hydrocracking zone containing a hydrocracking catalyst wherein said hydrocracking catalyst is a bulk metal catalyst comprising non-noble Group VIII metal molybdate in which at least a portion but less than all of molybdenum is replaced by tungsten;

(b) hydrocracking the feedstock under hydrocracking conditions to produce a hydrocracked feedstock;

(c) conducting the hydrocracked feed to a second hydrocracking zone containing a second hydrocracking catalyst and hydrocracking the first hydrocracked feed under hydrocracking conditions to produce a second hydrocracked feed; and

(d) fractionating the second hydrocracked feed to produce a distillate lubricating oil fraction.

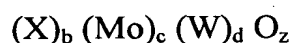
3. The process of claim 2 wherein the second hydrocracking catalyst is a bulk metal catalyst comprising non-noble Group VIII metal molybdate in which at least a portion but less than all of molybdenum is replaced by tungsten.

4. The process of claim 2 wherein the second hydrocracking catalyst is a crystalline or amorphous metal oxide.

5. The process of claim 4 wherein the crystalline metal oxide is a zeolite.

6. The process of claim 4 wherein the amorphous metal oxide is silica-alumina.

7. The process of claims 1, 2 or 3 wherein the bulk metal catalyst is represented by the formula:



wherein X is non-noble Group VIII metal, the molar ratio of b:(c+d) is 0.5/1 to 3/1, the molar ratio of c:d is >0.01/1, and $z = [2b + 6(c + d)]/2$.

8. The process of claim 7 wherein the molar ratio of b:(c+d) is 0.75/1 to 1.5/1.

9. The process of claim 8 wherein the molar ratio of $b:(c+d)$ is 0.75/1 to 1.25/1.
10. The process of claim 7 wherein the molar ratio of $c:d$ is $>0.1/1$.
11. The process of claim 10 wherein the molar ratio of $c:d$ is 1/10 to 10/1.
12. The process of claim 11 wherein the molar ratio of $c:d$ is 1/3 to 3/1.
13. The process of claim 1 wherein the hydrocracking conditions include temperatures of from 300 to 480 °C, hydrogen pressures of from 1000 to 3500 psig (6995 to 24234 KPa), liquid hourly space velocities of from 0.2 to 4.0 and hydrogen treat gas rates of from 1000 to 15000 scf/B (178 to 2670 m^3/m^3).
14. The process of claim 2 wherein the hydrocracking conditions in the first and second hydrocracking zones include temperatures of from 300 to 480 °C, hydrogen pressures of from 1000 to 3500 psig (6995 to 24234 KPa), liquid hourly space velocities of from 0.2 to 4.0 and hydrogen treat gas rates of from 1000 to 15000 scf/B (178 to 2670 m^3/m^3).
15. The process of claims 1 or 2 wherein the distillate lubricating oil fraction is solvent extracted under solvent extraction conditions to produce a raffinate rich in paraffinic hydrocarbons and an extract rich in aromatic hydrocarbons.
16. The process of claim 15 wherein the raffinate is solvent or catalytically dewaxed.

17. The process of claims 1 or 2 wherein the distillate lubricating oil fraction is solvent or catalytically dewaxed.
18. The process of claim 15 wherein the solvent is furfural, phenol or N-methyl-2-pyrrolidone.
19. The process of claim 16 wherein solvent or catalytically dewaxed product is hydrofinished under hydrofinishing conditions.
20. The process of claim 17 wherein solvent or catalytically dewaxed product is hydrofinished under hydrofinishing conditions.
21. The process of claim 16 wherein catalytic dewaxing is by an eight, 10 or 12 ring molecular sieve.
22. The process of claim 17 wherein catalytic dewaxing is by an eight, 10 or 12 ring molecular sieve.
23. The process of claim 21 wherein the 10 ring molecular sieve is a zeolite or a silicoaluminophosphate.
24. The process of claim 22 wherein the 10 ring molecular sieve is a zeolite or a silicoaluminophosphate.
25. The process of claim 19 wherein the hydrofinishing conditions include a temperature of from 200 to 370 °C, pressure of from 150 to 3000 psig (1136 to 20786 kPa), liquid hourly space velocity of from 0.2 to 5.0 and a hydrogen treat rate of from 100 to 5000 scf/B (17.8 to 890 m³/m³).

26. The process of claim 20 wherein the hydrofinishing conditions include a temperature of from 200 to 370 °C, pressure of from 150 to 3000 psig (1136 to 20786 kPa), liquid hourly space velocity of from 0.2 to 5.0 and a hydrogen treat rate of from 100 to 5000 scf/B (17.8 to 890 m³/m³).

27. The process of claim 25 wherein the hydrofinishing conditions include an hydrofinishing catalyst containing at least one Group VIII metal.

28. The process of claim 26 wherein the hydrofinishing conditions include a hydrofinishing catalyst containing at least one Group VIII metal.

29. The process of claim 27 wherein the hydrofinishing catalyst is the bulk metal catalyst.

30. The process of claim 28 wherein the hydrofinishing catalyst is the bulk metal catalyst.

31. The process of claims 1 or 2 wherein the lubricating oil basestocks are Group III basestocks having at least about 90% saturates, a sulfur content less than about 0.03 wt.% and a VI of at least 120.

32. The process of claims 1 or 2 wherein the lubricating oil basestocks are Group II basestocks having at least about 90% saturates, a sulfur content less than about 0.03 wt.% and a VI less than 120.

33. The process of claim 7 wherein X is Ni or Co.

34. The process of claim 7 wherein X is Ni.

(b) fractionating hydrocracked feedstock to produce a distillate lubricating oil fraction.

Another embodiment of the invention relates to a process for producing lubricating oil basestocks which comprises:

(a) feeding a hydrocarbon feedstock derived from at least one of thermal treatment, catalytic treatment, extraction, dewaxing or fractionation of a petroleum crude or fraction thereof, shale oil, tar sands or synthetic crude, to a first hydrocracking zone containing a hydrocracking catalyst wherein said hydrocracking catalyst is a bulk metal catalyst comprising non-noble Group VIII metal molybdate in which at least a portion but less than all of molybdenum is replaced by tungsten;

(b) hydrocracking the feedstock under hydrocracking conditions to produce a hydrocracked feedstock;

(c) conducting the hydrocracked feed to a second hydrocracking zone containing a second hydrocracking catalyst and hydrocracking the first hydrocracked feed under hydrocracking conditions to produce a second hydrocracked feed; and

(d) fractionating the second hydrocracked feed to produce a distillate lubricating oil fraction.

In another preferred embodiment of the present invention the catalyst composition is prepared by a process which comprises contacting at least one Group VIII non-noble metal component with the Group VIB metal component in